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DRAFT Management Indicator Species Report



Pine Mountain Late Succession Reserve Habitat Enhancement and Protection Project

Upper Lake Ranger District, Mendocino National Forest
Lake County, California

For Information Contact: [Cassandra Hagemann](#)
[10025 Elk Mountain Rd,](#)
[Upper Lake, CA 95485](#)
[\(707\)275-1416](#)

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Introduction

Purpose

The purpose of this report is to discuss the effects of action alternatives of the Pine Mountain Late Successional Habitat Enhancement and Protection project (referred to as Pine Mountain project) on the 13 Management Indicator Species (MIS) identified in the Mendocino National Forest Land and Resource Management Plan (LRMP). Fisheries and botany effects are discussed in separate reports.

This report compliments and relies, in part, on information and analysis located in the following documents:

1. Biological Evaluation (BE), a document prepared by the Forest Service that assesses effects on Forest Service Sensitive Species.
2. Biological Assessment (BA), a document prepared by the Forest Service that assesses the effects on federally listed Threatened and Endangered Species.

Project-level effects on MIS are analyzed and disclosed as part of environmental analysis under the National Environmental Policy Act (NEPA). This involves examining the impacts of the proposed project alternatives on MIS habitat by discussing how direct, indirect, and cumulative effects will change the quantity and/or quality of habitat in the analysis area.

These project-level impacts to habitat are then related to national forest scale population and/or habitat trends. The appropriate approach for relating project-level impacts to broader scale trends depends on the terms in the LRMP.

Adequately analyzing project effects to MIS, including Threatened, Endangered, and Sensitive (TES) species that are also MIS, involves the following steps:

- Identifying which MIS have habitat that would be either directly or indirectly affected by the project alternatives; these MIS are potentially affected by the project.
- Identifying the LRMP forest-level monitoring requirements for this subset of forest MIS.
- Analyzing project-level effects on habitats or habitat components for this subset of forest MIS.
- Discussing forest scale habitat and/or population trends for this subset of forest MIS.
- Relating project-level impacts on MIS habitat to habitat and/or population trends for these MIS at the forest.

These steps are described in detail in the Pacific Southwest Region's draft document "MIS Analysis and Documentation in Project-Level NEPA, R5 Environmental Coordination".

Current conditions

The California Wildlife Habitat Relationship program has identified fourteen different vegetation types within the Pine Mountain project area (**Table 1 & 2**). Within these habitat types are a mosaic of conditions like areas of large diameter trees with little understory, areas of large trees with a three storied layer which can lead to a fire being carried into the crown, dense medium sized trees, chaparral,

burned areas, and plantations in varying conditions (Fuels report). These conditions are combination of historic vegetation conditions, historical pre-suppression era fires, fire suppression, suppression era fires, forest health, timber harvest activities, weather events, and climate influence (Silviculture report).

Table 1 - Forested vegetation types within the Pine Mountain project area based on CWHR program

CWHRTYPE CODE	Vegetation Type	Seral Stage Acres				
		Early	Mid	Late	Mature	Total Acres
BOP	Blue Oak-Foothill Pine		1			1
BOW	Blue Oak Woodland		7			7
COW	Coastal Oak Woodland	9	6			15
CPC	Closed-Cone Pine-Cypress	11	18			29
DFR	Douglas Fir	67	35	35	389	526
MHC	Montane Hardwood-Conifer	142	404	726		1272
MHW	Montane Hardwood	179	907	479		1565
PPN	Ponderosa Pine	214	28	92	87	421
SMC	Sierran Mixed Conifer	509	527	1947	2264	5247
	Grand Total	1131	1933	3279	2740	9083

Table 2 - Non-forested vegetation types within the Pine Mountain project area based on the CWHR program

CWHRTYPE CODE	Vegetation Type	Seral Stage Acres				
		Seedling	Young	Mature	Decadent	Total Acres
AGS	Annual Grass					127
PGS	Perennial Grassland					3
CRC	Chamise-Redshank Chaparral				208	208
CPCH	Mixed Chaparral				740	740
MCP	Montane Chaparral				47	47

	Grand Total				995	1125
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*California Wildlife Habitat Relationship

Past management activities and natural processes have resulted in increased tree densities leading to fuel connectivity between the lower and upper canopies and altered species composition by hardwoods being shaded out by conifers and a loss of ponderosa pine due to competition with conifer species. These conditions are contributing to declining forest health and density related tree mortality within stands susceptible to drought-induced tree mortality because of intense inter-tree competition for light, nutrients, and water. The overall effect impacts species diversity, contributes to a substantial increase in surface fuel loading and ladder fuel connectivity, and surface and ladder fuel conditions. There are higher concentrations of live ladder fuels, greater amounts of dead standing trees, and greater amounts of small diameter woody debris on the ground. When the large diameter pine trees fall out as individual or in clump concentrations, they take out some of the ladder fuel trees creating heavy surface fuel concentrations around the downed larger pine trees. As a result, the potential for the project area to burn at high severity, where most mature trees are killed, has increased dramatically. Wildfires under these conditions are larger, more intense, erratic, and difficult to control. Firefighter safety, ecosystem sustainability, and late-successional species populations are all compromised under these conditions (Silviculture report).

Based on available fire records, there have been 66 natural and human caused fires in or around the Pine Mountain project area from 1927 to 2008. Out of the 66 fires, 16 were larger than 50 acres. It is important to note that this area is far departed from the historical fire regime, stands are in a condition to burn with higher severity effects, and many starts could have become larger fires given the past trend of larger fires on the Mendocino National Forest. Many of these larger fires have had significant areas of moderate to high intensities (Forks, Spanish, North Pass, and Mill fires).

The Back Fire burned about 1500 acres and created a mosaic of burn effects across the burn area. The fire occurred fairly early in the fire season (June) of 2008 and resulted in effects that were less intense and had less damage to the resources than it would have had it occurred later in July or August. Initial mortality occurred but trees have continued to die and fall creating elevated levels of larger surface fuels that increases the fire hazard within the Back Fire perimeter. The buildup of larger surface fuels leads to a more intense fire and longer residence times which has greater impacts on surrounding vegetation and soil. Current surface fuel loading is moderate to high and understory burns would burn at moderate intensity with patches of high intensity but other areas may be able to support a low intensity burn (Fuels report).

Desired Conditions

Desired conditions as described in the Mendocino National Forest Land and Resource Management Plan (LRMP) include an increase of spotted owl habitat capability, as well as increased habitat for species that depend on older forests. Future desired conditions also include a decrease in the size and/or intensity of wildfires and the potential for losses from major forest pests.

The Pine Mountain Late Successional Reserve Assessment (LSRA) identifies the project area as having a history of frequent, low-intensity fires. The recent larger fires have portions that have burned at higher intensity as a result of fire suppression. The LSRA rates fuels hazard as moderate, while more recent and similar analysis of the project area is rated as high (Fuels report). Desired condition is to reduce this fire hazard rating.

As stated in the northern spotted owl recovery plan we need to be maintaining or improving ecosystem resilience in the face of climate change. Resilient forests are those that not only accommodate a gradual change related to climate but tend to return toward a prior condition after disturbance either naturally or with management assistance (Millar et al. 2007). Managing for a resilient forest should also be considered a fundamental recovery goal for spotted owls. Federal land managers should apply ecological forestry principles where long term spotted owl recovery will benefit, even if short-term impacts to spotted owls may occur (Franklin et al 2007).

Purpose and need

There is a need to propose treatments that will help simulate the ecosystem to reach a desirable condition over the long term. There is a need to enhance and restore late successional habitat for wildlife, as well as improve forest health, vigor, and resilience. There is a need to reduce the size and intensity of wildfire by breaking up large areas of contiguous fuels. There is a need to expand and maintain the LSR, including oak within the hardwood-conifer stands.

The primary purpose of project is to enhance wildlife habitat and reduce the risk of late-successional habitat loss from wildfire through vegetative treatments. These treatments are designed to create more fire resilient conditions and forest structure. The implementation of restorative fuel reduction treatments will result in a fire-resilient landscape in the future.

The LSRA identifies areas with high road densities that fragment wildlife habitat. Roads can also affect the natural hydrologic flow path, and if not designed and maintained properly, can lead to significant erosion and mass wasting problems. There is an opportunity within this project to decommission or close roads that are no longer needed, and storm proof ones that will receive future use. There is a need to develop and manage a transportation system that minimizes the impacts of roads on the landscape.

Treatments are being designed to accomplish the following Purpose and Need objectives:

- Reduce the risk to late-successional habitat loss from wildfire through vegetative treatments designed to modify and restore characteristic fire regimes and forest structure.
- Improve forest health, vigor, and resilience to fire, insects and disease as well as enhance the diversity of plant and animal habitat found within the project area while restoring and enhancing late successional habitat.
- Manage National Forest System lands (including roads and trails) to meet the Aquatic Conservation Strategy Objectives and direction set forth in the Mendocino National Forest Land and Resource Management Plan (LRMP).

In conclusion, the project aims to reduce the risk of large scale disturbances such as stand replacing fire. Reduced risks from wildland fire direct contribute to wildlife habitat protection and enhancement. Based on the guiding principles from the LSR assessment, this project is designed to achieve the objectives and facilitate ecosystem restoration for a more sustainable future condition.

Proposed Actions

Alternatives

Alternative 1 – No Action

While this alternative takes no action at this time, on-going activities such as routine road maintenance, fire suppression, and recreation may still occur in this area. This alternative serves as a baseline against which to compare to the other action alternatives. Under this alternative no fuels treatments, forest health, or reforestation treatments would be implemented to accomplish the purpose and need. The intent and the desired condition set forth in the LRMP and NWFP would not be achieved. While no costs would be directly incurred with this alternative, future costs may include wildfire suppression and rehabilitation activities.

Alternative 2 – Proposed Action

For a full description of the Proposed Action see **Chapter 2** in the EIS.

Alternative 3 – No new temporary roads

This alternative would follow actions proposed in Alternative 2, with the exception of creating new temporary roads (about 0.25 miles).

Alternative 4 – No thinning about 10" DBH in Riparian Reserves

This alternative would follow actions proposed in Alternative 2, with the exception of thinning above 10" DBH in riparian reserves.

Alternative 5 – No thinning above 10"DBH in know Northern spotted owl nesting habitat

This alternative would follow actions proposed in Alternative 2, with the exception of thinning about 10" DBH in known NSO nesting habitat.

Cumulative Effects

Past Federal Actions and Activities

The source of information for past federal actions and activities is located within the Forest Service Forest Service Activity Tracking System (FACTS) database. The temporal boundary is 20 years (1995-2015) and the spatial boundary is within the 7th field watershed.

All recorded activities are displayed on the map below (Figure 1). There are two general categories of activities: vegetation treatment (logging, site preparation, and tree planting) and fuels treatment (past burning and fuels work). Past activities are considered and incorporated into the environmental analysis, as they contributed to the existing condition.

Table 3 - Summary of past actions from 1995-2015 within the 7th field watersheds of the Pine Mountain project from the FACTS database

Activity	Date	On map
Broadcast Burning - Covers a majority of the unit	2002-2005	burning
Burning of Piled Material	2005-2013	burning
Certification of Natural Regeneration with Site Prep	1995	site prep
Certification of Natural Regeneration without Site Prep	2011	
Certification-Planted	1995-1996	tree planting
Chipping of Fuels	2004-2010	fuels work
Commercial Thin	2005-2008	logging
Fertilization	1995-1997	
Fill-in or Replant Trees	1996 and 2006	tree planting
Invasive - Mechanical /Physical	2009	
Invasive - Pesticide Application	2005	
Overstory Removal Cut (from advanced regeneration) (EA/RH/FH)	1997	logging
Piling of Fuels, Hand or Machine	2004-2012	fuels work
Plant Trees	1996,2004,2006,2010-2012	tree planting
Plantation Survival Survey	2004-2011	
Post Treatment Vegetation Monitoring	1995	
Precommercial Thin	1995-2012	fuels work
Rearrangement of Fuels	2003, 2008 and 2011	fuels work
Reforestation Need Created by Fire	2008	tree planting
Silvicultural Stand Examination	2005	
Site Preparation for Planting - Burning	2009	site prep
Site Preparation for Planting - Mechanical	2003 and 2008	site prep
Stand Silviculture Prescription	1996 and 2004	
Stocking Survey	1995-2008	
Thinning for Hazardous Fuels Reduction	2004-2012	fuels work
Tree Release and Weed	1995-2001	fuels work
TSI Need	1995-2008	
Underburn - Low Intensity (Majority of Unit)	2002-2013	fuels work
Wildfire - Fuels Benefit	2008	
Yarding - Removal of Fuels by Carrying or Dragging	2005 and 2007	logging

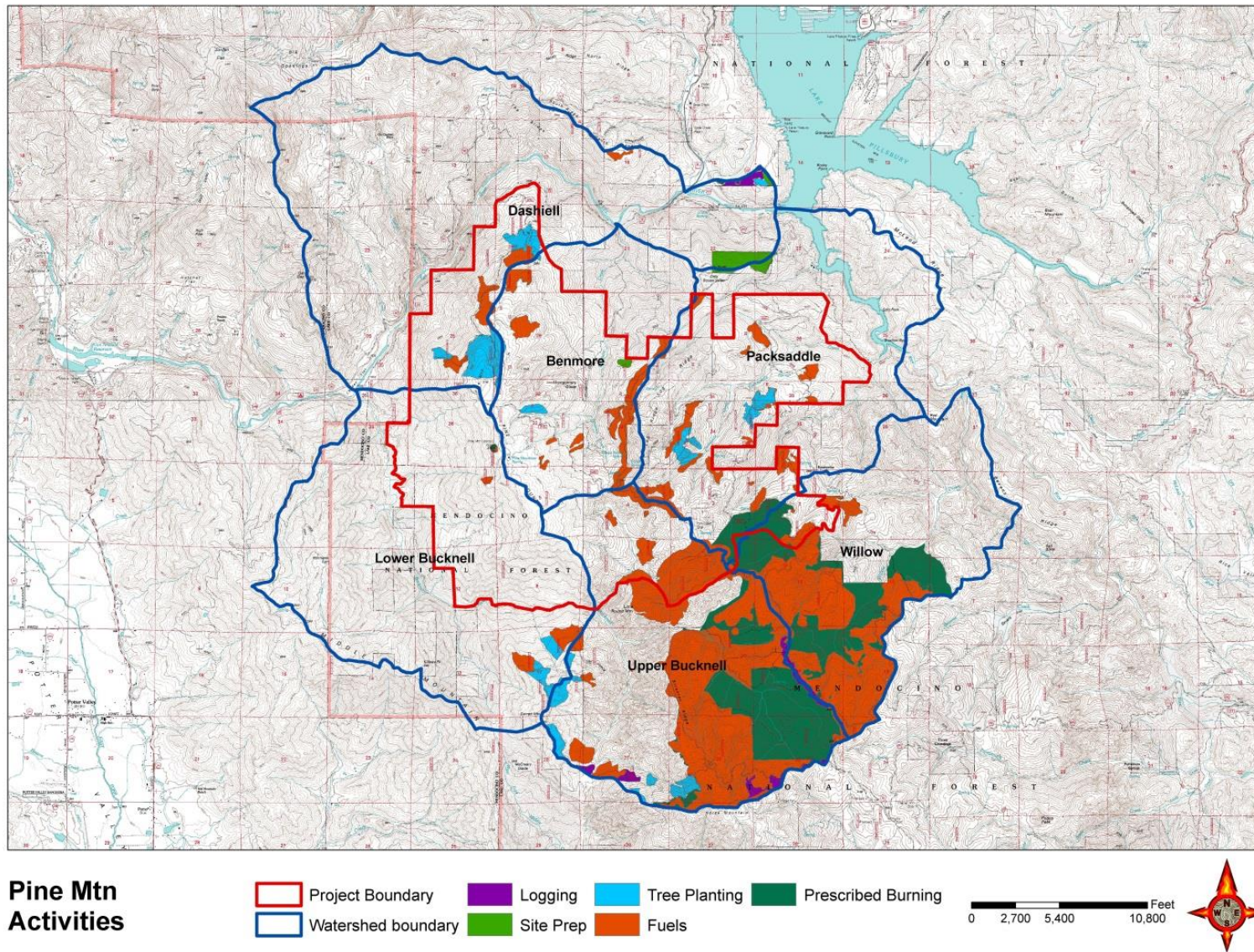


Figure 1 - Past, present, and future actions within the 7th field watersheds of the Pine Mountain project

Concurrent and Foreseeable Actions

The following projects are described as current and reasonably foreseeable future actions that may be considered in addition to the proposed project for analysis. Some ongoing actions are within the Pine Mountain project area; this list includes actions within the Dashiell, Packsaddle, Benmore, Willow, Upper Bucknell and Lower Bucknell 7th field watersheds.

The list also includes some actions immediately adjacent to these watersheds that may affect the environment of the project area.

Howard Mill Project (*planning complete, implementation ongoing*) is located within the Upper Bucknell Creek, Packsaddle, Willow, Bevans, Parramore, Sled Ridge, Grizzly Canyon and panther Canyon 7th field watersheds. The project encompasses about 7,400 acres. The main purpose of this project is to reduce hazardous fuel loading and competing vegetation in the mixed conifer plantations that were planted following the Round Fire in 1966. Approximately 4,900 acres have been understory burned since project implementation began.

Pine Mtn Lookout Project (*planning complete, implementation ongoing*) is located within the Lower Bucknell Creek 7th field watershed. The project encompasses about 26 acres, and includes hazardous fuels thinning >8" DBH and pile and understory burning. The main purpose of this project is to reduce hazardous fuel loading and to lessen the risk of fire, thereby protecting the historic lookout. Thinning was completed in 2007.

Elk Mountain Fuelbreak (*planning complete, implementation ongoing*) is located between the Middle Creek Campground and the Rice Fork turn off at Lake Pillsbury along Elk Mountain Rd (M-1). The project is about 700 acres, and includes hazardous fuels thinning >10" DBH and understory burning. The primary purpose of this project is to maintain a shaded fuelbreak along Elk Mountain Rd, serving as a strategic control point in an area historically known for large wildfires.

Westshore Project (*planning complete, implementation ongoing*) is located within the Welch, Mill, Boardman, and Dashiell 7th field watersheds. The project consists of 13 units and encompasses about 1,069 acres. The project includes hazardous fuels thinning >10" DBH, timber harvest, and pile and understory burning. The primary purpose of this project is to reduce hazardous fuels in the wildland-urban interface in the Lake Pillsbury Area. Timber Harvest was completed in 2013.

Streeter Ridge Project (*planning complete, implementation ongoing*) is located within the Upper Bucknell Creek 7th field watershed. The project encompasses about 262 acres, and includes hazardous fuels thinning >10" DBH and pile and understory burning. The main purpose of this project is to reduce hazardous fuel loading and competing vegetation in the mixed conifer plantations that were planted following the Round Fire in 1966. Thinning was completed in 2010.

Willow Creek Project (*planning complete, implementation ongoing*) is located within the Willow, Parramore, and Bevans 7th field watersheds. The project encompasses about 335 acres, and includes hazardous fuels thinning >10" DBH and pile and understory burning. The main purpose of this project is

to reduce hazardous fuel loading and competing vegetation in the mixed conifer plantations that were planted following the Round Fire in 1966. The majority of the thinning was completed in 2011 and 2013.

High Horse Project (*planning complete, implementation ongoing*) is located within the Upper Bucknell, Parramore, Grizzly Canyon and Panther Canyon 7th field watersheds. The project encompasses about 545 acres in the Horse Mountain area, and includes hazardous fuels thinning >10" DBH, timber harvest, and pile and understory burning. The main purpose of this project is to reduce hazardous fuel loading and competing vegetation in the mixed conifer plantations that were planted following the Round Fire in 1966. Timber Harvest was completed in 2007.

There are no known additional future federal actions, other than the proposed actions and alternatives described in the Pine Mountain project (Chapter 2).

There are no known timber harvesting activities within private inholdings adjacent to the project area within the 7th field watershed. This conclusion was drawn from the California Department of Forestry and Fire Protection website inventory of approved timber harvest plans (THP) from October 2015.

(<http://www.calfire.ca.gov/ResourceManagement/THPStatusUpload/THPStatusTable.html>)

Species Being Evaluated

Management Indicator Species

Thirteen wildlife species have been selected as management indicator species (MIS) for the Mendocino National Forest. These species are identified in the Land and Resource Management Plan (LRMP) for the Mendocino which was developed under the 1982 National Forest System Land and Resource Management Planning Rule. These MIS were selected for because their population changes may indicate the effects of management activities [36 CFR 219.19(a)(1)] and were selected and used during forest planning to help compare the effects of alternatives.

The MIS whose habitat would be either directly or indirectly affected by the Pine Mountain project, identified as Category 3 in **Table 4**, are carried forward in this analysis, which will evaluate the direct, indirect, and cumulative effects of the proposed action and alternatives on the habitat of these MIS. The MIS selected for Project-Level MIS analysis for the Pine Mountain project are:

Table 4 - Management Indicator Species that were selected for the Pine Mountain Late Successional Habitat Enhancement and Protection project

Management Indicator Species	Species Status	LRMP Habitat Indicator	Category for Project Analysis ¹
Pileated woodpecker	Maintenance	Old growth ² , snags, CWD	3
Northern spotted owl	Threatened/Endangered	Old growth, snags, CWD	3

¹ Category 1: MIS whose habitat is no in or adjacent to the project area and would not be affected by the project

Category 2: MIS whose habitat is in or adjacent to project area, but would not be either directly or indirectly affected by the project

Category 3: MIS whose habitat would be either directly or indirectly affected by the project

² In this context, old growth refers to late successional stands

Management Indicator Species	Species Status	LRMP Habitat Indicator	Category for Project Analysis ¹
Northern goshawk	Sensitive	Old growth, snags, CWD, riparian	3
Marten	Sensitive	Old growth, snags, CWD, riparian	3
Fisher	Sensitive	Old growth, snags, CWD, riparian	3
California thrasher	Maintenance	Brush field	3
Acorn woodpecker	Maintenance	Snags, hardwoods	3
Western gray squirrel	Harvest	Snags, hardwoods	3
Douglas tree squirrel	Harvest	Snags, true fir	3
Black-tailed deer	Harvest	Hardwoods, riparian, brush fields, meadows	3
Tule elk	Special interest	Hardwoods, meadow, riparian	3
Bald eagle ³	Sensitive	Riparian	3
Peregrine falcon ³	Special interest	Riparian, lithic areas	3

Effects Evaluations

Selected Species

Late Successional Forest/Old Growth Species

Northern Spotted Owl (*Strix occidentalis*), Fisher (*Pekania pennant*), Northern Goshawk (*Accipiter gentilis*), Marten (*Martes caurina*)

Northern spotted owl, fisher, northern goshawk, and marten and their habitat are discussed in the Biological Evaluation.

Pileated Woodpecker (Dryocopus pileatus)

See Snag Dependent Species for discussion on habitat needs.

Effects on All Late Successional/Old Growth Dependent Species

Alternative 1 - No Action

Under the No Action alternative the late successional/old growth forests would remain susceptible to stand replacing wildfires due to stressed trees and heavy fuel loading. Stands are already more dense than they were historically and surface fuels more excessive. Fuel loading would continue without treatment as snags fall and woody debris collects on the ground. Many of the stands are at a high risk of moderate to high severity fire. Stressed trees are less resilient to disease and insects and become more fuel for the fire to carry across large acreages.

Within the Back Fire area, where late successional habitat persists, ladder and surface fuels would continue to accumulate putting the habitat at risk of a high severity fire. Where trees that were killed by

³ Bald eagle and peregrine falcon were removed from the Endangered Species List

the Back Fire have fallen, and continue to fall for the next 40 years, the large buildup of logs will cause fires to put off more heat and burn in one place for a longer period of time (Fuels report). This could lead to higher intensities fire that will threaten the late successional habitat left within the Back Fire perimeter.

The No Action alternative could potentially remove late successional habitat from the landscape due to the risk of a moderate or high severity fire.

Cumulative Effects

Past and current actions have focused on reducing fuels and competing vegetation to protect and enhance habitat on the landscape. The no action alternative would have no direct effects cumulatively. Indirect effects could include a high intensity fire moving into areas surrounding the project area that were previously treated and potentially have adverse effects on habitat.

Alternative 2 - Proposed Action

The proposed action's goal is to enhance and protect the current late successional habitat within the project boundary.

Under the Proposed Action all treatment prescriptions will receive prescribed fire in some capacity. Prescribed fire may be applied before or after hand or mechanical thinning treatments or by itself. Prescribed fire is expected to reduce the amount of small diameter surface fuels, kill portions of the understory vegetation, and suppress brush regrowth. Burning may kill trees in the overstory but mortality is expected to be less than 10% in trees >16" DBH (Fuels report). When planning a prescribed fire several factors are considered that would affect fire behavior so as not to have detrimental effects on late successional habitat: relative humidity, wind speed, temperature, fuel moisture levels, seasonal conditions, aspect, slope, and vegetation type. Prescribed fire will reduce the potential intensity of any wildfires that would burn the area within the next 10-15 years (Fuels report) thus protecting the late successional habitat from stand replacing wildfires.

Treatment Prescription 1

This treatment focuses on treating early successional plantations (Table 5). This treatment reduces tree density, emphasizing the retention within the upper end of the diameter range (4-12") and increasing the distance between trees. Although this treatment does not directly affect late successional habitat it will stimulate trees in early and mid-successional stands and encourage a quicker advancement towards late successional characteristics. This process will take time but will be beneficial to late succession/old growth Management Indicator Species in the long-term. This treatment effects a total of 364 acres.

Table 5 - Plantation existing conditions

Unit	Year Planted	Acres	Planted Spacing	Planted Number Trees Per Acre	Vegetation Type
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Unit	Year Planted	Acres	Planted Spacing	Planted Number Trees Per Acre	Vegetation Type
40	1988	36	7x14	444	DFR ⁴ , MCH ⁵ , MHC ⁶
41	1990	37	6x6	1210	DFR, SMC ⁷
43	1992	13	6x6	1210	SMC
44	1988	14	7x14	444	DFR, MHC
45	1988	17	7x14	444	MCH, SMC
46	1996	32	6x6	1210	SMC
47	1989	13	6x6	1210	PPN ⁸
48	1988	4	7x14	444	DFR
49	1989	5	6x6	1210	PPN
50	1988	8	7x14	444	SMC
51	1988	5	6x6	1210	SMC
52	1990	9	6x6	1210	PPN
53	1985	28	7x14	444	MCH, PPN
54	1986	17	7x14	444	SMC
55	1986	17	7x14	444	PPN
56	1985	19	7x14	444	PPN
57	1986	2	7x14	444	PPN
58	1986	11	7x14	444	SMC
59	1988	5	7x14	444	PPN
60	1981	10	7x14	444	MCH, PPN
61	1986	9	7x14	444	MCH, PPN
62	1986	6	7x14	444	MCH, PPN
63	1981	47	7x14	444	CPC ⁹ , DFR, SMC

Treatment Prescription 2

This treatment focuses on promoting late successional habitat within naturally forested areas. Treatments will break up fuel continuity to facilitate prescribed fire and reduce stocking levels to promote late successional habitat development. The high density of small trees contributes to ladder fuel while mortality of these small trees adds to surface fuel concentrations.

Existing vegetation types within this treatment can found in [table 6](#).

⁴ Douglas-fir

⁵ Mixed chaparral

⁶ Montane hardwood-conifer

⁷ Sierran mixed conifer

⁸ Ponderosa pine

⁹ Closed-cone pine-cypress

Table 6 - Existing habitat types within the naturally forested areas treatment units

CWHRTYPE CODE	CWHR Vegetation Type	Acreage
SMC	Sierran Mixed Conifer	2056
MHC	Montane Hardwood Conifer	452
MHW	Montane Hardwood	423
MCH	Mixed Chaparral	206
DFR	Douglas fir	145
PPN	Ponderosa Pine	144
AGS	Annual Grass Land	38
MCP	Montane Chaparral	27
CPC	Closed Cone Pine	13
CRC	Chemise redshank Chaparral	11
COW	Coastal Oak Woodland	9
	Grand Total:	3523

There will be no changes post-treatment to the vegetation type or successional stage and canopy cover will remain between 50-80 percent. Similar to Treatment Prescription 1, this treatment will be beneficial in the long-term to late successional MIS by providing habitat protection and enhancement and promoting successional stage development by reducing the density of trees <10" DBH and reducing surface fuels to improve resiliency of the stands to insects, disease, drought, and wildfire. By removing trees 10-20" around individual conifers and hardwoods the treatment will promote tree growth and advance large tree development.

Removing small diameter trees and brush raises canopy base height and reduces the chance of a fire entering the crowns thus protecting late successional habitat within and surrounding the project area.

Treatment Prescription 3

Treatment prescription 3 applies commercial ecological fuel reduction thinning and post-thinning prescribed fire to forested areas that express mid or late successional habitat on or near ridgetops or upper slopes to protect and enhance the current habitat. Table 7 displays current vegetation types and successional stages within these treatment units.

Table 7 - Pre-treatment vegetation types and successional stages within Treatment Prescription 3 units

Unit	CWHR Vegetation Type								Pre-Treatment Successional Stage			Total Acres	Percentage of Units Late Successional
									Early	Mid	Late		
	COW	DFR	MCH	MCP	MHC	MHW	PPN	SMC					
3A								12			12	12	100%
3B								24			24	24	100%
4					1	4		81		85	1	86	1%
5					9	9		11	1	28		29	0%
6					1	7	7	98	2	29	82	113	73%
7								77		77		77	0%
8	1	1			3	1		125	3	128		131	0%
9		15						1	1	15		16	0%
12								32		32		32	0%
13		1			9	5		44		59		59	0%
14					4		4	83	1	90		91	0%
15					7		4	96	2	105		107	0%
16								59		59		59	0%
17						6	4	47	4		53	57	2%
18					14	17	37	65		17	116	133	87%
19						1		19	4		16	20	36%
21		3						20			23	23	100%
22								19			19	19	100%
23			1			17		30			48	48	100%
24A		1						13		14		14	0%
24B								9		9		9	0%
24C		1					7	17			25	25	100%
24D		7					12	2		21		21	0%
25						9		3			12	12	100%

Unit	CWHR Vegetation Type								Pre-Treatment Successional Stage			Total Acres	Percentage of Units Late Successional
									Early	Mid	Late		
	COW	DFR	MCH	MCP	MHC	MHW	PPN	SMC					
26							2	55	2		55	57	96%
27								17		17		17	0%
28							11				11	11	100%
29							24	14			38	38	100%
30								10		10		10	0%
31							1	23			24	24	100%
32								45			45	45	100%
33A								10			10	10	100%
33B								18		18		18	0%
34								11			11	11	100%
35								36			36	36	100%
37							1	142	1	142		143	0%
38								5			5	5	100%
39								59		59		59	0%

This treatment would increase the acreages of late successional habitat within the Pine Mountain project area. **Table 8** shows post-treatment acreages of late successional habitat within each treatment unit. In total, 997 acres are enhanced into late successional habitat. This enhancement is achieved by reducing the number of small trees within the stands thus raising the QMD.

Treatment will reduce competition between trees for light, nutrients, and water which will improve growth and health while also reducing potential mortality from stressors allowing stands to maintain late successional habitat.

Table 8 - Post-Treatment vegetation types and successional stages within Treatment Prescription 3

Unit	CWHR Vegetation Type	Post-Treatment Successional Stages			
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												Total Acres	Percentage of Units Late Successional	Acreages Enhanced to Late Successional
	COW	DFR	MCH	MCP	MHC	MHW	PPN	SMC	Early	Mid	Late			
3A								12			12	12	100%	0
3B								24			24	24	100%	0
4					1	4		81			86	86	100%	85
5					9	9		11	1		28	29	97%	28
6					1	7	7	98	2		111	113	98%	29
7								77			77	77	100%	77
8	1	1			3	1		125	3		128	131	98%	128
9		15						1	1		15	16	94%	15
12								32			32	32	100%	32
13		1			9	5		44			59	59	100%	59
14					4		4	83	1		90	91	99%	90
15					7		4	96	2		105	107	98%	105
16								59			59	59	100%	59
17						6	4	47	4		53	57	93%	0
18					14	17	37	65		17	116	133	87%	0
19						1		19	4		16	20	80%	0
21		3						20			23	23	100%	0
22								19			19	19	100%	0
23			1			17		30			48	48	100%	0
24A		1						13			14	14	100%	14
24B								9			9	9	100%	9
24C		1					7	17			25	25	100%	0
24D		7					12	2			21	21	100%	21
25						9		3			12	12	100%	0
26							2	55	2		55	57	96%	0
27								17			17	17	100%	17
28							11				11	11	100%	0

Unit	CWHR Vegetation Type								Post-Treatment Successional Stages			Total Acres	Percentage of Units Late Successional	Acreages Enhanced to Late Successional
	COW	DFR	MCH	MCP	MHC	MHW	PPN	SMC	Early	Mid	Late			
29							24	14			38	38	100%	0
30								10			10	10	100%	10
31							1	23			24	24	100%	0
32								45			45	45	100%	0
33A								10			10	10	100%	0
33B								18			18	18	100%	18
34								11			11	11	100%	0
35								36			36	36	100%	0
37							1	142	1		142	143	99%	142
38								5			5	5	100%	0
39								59			59	59	100%	59
Totals	1	29	1	0	111	139	114	1432	21	17	1663	1701		997

In conclusion, treatment prescription 3 increases the acreage of available late successional habitat for late successional Management Indicator Species. This treatment will change 19 units from mid-successional to late successional habitat (Table 7 & 8). By removing the smaller trees from within the stands the proportion of successional stages shifts thus changing the successional stages. It also protects current late successional habitat from wildfire by reducing ladder and surface fuels decreasing the risk of torching and crown fire and decreasing flame lengths (Table 9). Although opening up the stands may increase the amount of sunlight reaching the ground and decrease wind sheltering from trees, which may lead to a higher rate of fire spread, actively reducing fuel loadings will mitigate fire intensity making the effects of fire burning through the stands less damaging (Fuels report).

Table 9 - Comparison of alternatives 1 & 2 and their resulting Crown Fire Activity and Flame Lengths

CFA Class	Alternative 1 - No Action	Alternative 2 – Proposed Action
Surface	18%	92%
Torch	33%	5%
Crown	49%	4%

Flame Length		
<4 feet	22%	92%
4-8 feet	1%	1%
8-11 feet	1%	0%
>11 feet	77%	7%

Treatment Prescription 4

Treatment prescription 4 will not change the vegetation type or current successional stage. This treatment maintains the larger black oak, sugar pine, ponderosa pine, and Douglas-fir while reducing the trees <10" DBH and maintaining a higher canopy cover. This treatment will aid in the protection of the late successional habitat on the landscape by reducing tree density and providing a strategic location on the landscape to slow wildfire.

Treatment Prescription 5

Treatments in chaparral will break up large contiguous chaparral fields to reduce fuels. This treatment will not directly affect late successional habitat but will aid in wildfire protection.

Treatment Prescription 6

Treatments within the Back Fire perimeter will reduce surface fuel loading and tree density (<10" DBH) and maintain the fire return interval within the fire's footprint. Burn preparations, pile or jackpot burning, along with prescribed fire will protect late successional habitat surrounding the fire perimeter as well as the habitat left after the fire. There will be no change to the vegetation types or seral stages post-treatment (Table 10). Although prescribed fire may kill trees in the overstory, mortality is expected to be less than 10% in trees greater than 16" DBH (Fuels report).

Table 10 - Treatment units within the Back Fire perimeter and their vegetation types and seral stages

Unit Number Seral Stage	CWHR Vegetation TYPE				
	Montane Hardwood Conifer	Montane Hardwood	Ponderosa Pine	Sierran Mixed Conifer	Total Acres
77	4	15	42	301	362
Early	4	15	28	30	77
Mid				16	16
Late			14	255	269
79				82	82
Early				1	1

Unit Number Seral Stage	CWHR Vegetation TYPE				
	Montane Hardwood Conifer	Montane Hardwood	Ponderosa Pine	Sierran Mixed Conifer	Total Acres
Mid				45	45
Late				36	36
Total	4	15	42	383	444

Treatment Prescription 7

Treatment prescription 7 applies riparian reserve design features to the above treatments and will not have additional effects.

This alternative would improve late successional habitat for species dependent on this habitat type.

Cumulative Effects

Past and current actions within the 7th field watersheds where the Pine Mountain project is located have been focused on fuel reduction and habitat enhancement. This alternative will connect habitat work on the landscape to create connectivity between the pieces of the Pine Mountain, Blue Slides, and Sanhedrin LSRs. These projects will have cumulatively reduced fuels to slow a wildfire or provide safe locations for fire suppression activities to take place.

Alternative 3 – No new temporary roads

The effects to late successional MIS will be the same under alternative 3 as they were under alternative 2 with the exception of units 13 and 14 under treatment 3. Without new temporary roads, units 13 and 14 may not have larger trees removed because skidding distances would be too long. These units have a high density of small to mid-sized trees >10" DBH that are dying and accumulating as fuels and reducing trees <10" DBH will not abate the density issue. Other than units 13 and 14, the rest of the area will be protected and enhanced for late successional species.

This alternative would improve late successional habitat for species dependent on this habitat type.

Cumulative Effects

Cumulative effects will be the same as alternative 2, beneficial to fuels reduction and connectivity of LSR habitat protection and enhancement projects.

Alternative 4 – No commercial thinning in Riparian Reserves

Alternative 4 would have the same effects on late successional habitat with the exception of habitat with riparian reserves which will only receive a thinning treatment in trees <10" DBH. Since riparian corridors can be a major path for fires it is important to reduce fuel loading in these areas to protect the

riparian reserves as well as habitat immediately surrounding them. Under this alternative torching and crown fire are more likely than alternative 2 (Table 11 & 12), but would still be improved over no action.

Table 11 - Comparison of flame lengths for alternatives 1, 2, and 4

	Fireline Intensity Hazard Rating	Percent of Area No Action	Percent of Area Alternative 2	Percent of Area Alternative 4	Percent Increase or Decrease (-)	
					Compare to No Action	Compare to Alt 2
less than 4	Low	22	92	79	57	-13
4-8	Moderate	1	1	3	2	2
8-11	High	1	0	1	0	1
11+	Very High	77	7	17	60	10

Table 12 - Comparison of CFA for alternatives 1, 2, and 4

Potential Crown Fire Class	Percent of Area No Action	Percent of Area Alternative 2	Percent of Area Alternative 4	Percent Increase or Decrease (-)	
				Compare to No Action	Compare to Alt 2
Surface Fire	18	92	73	55	-19
Crown Fire	49	4	8	-41	4
Torching	33	5	19	-14	14

This alternative would improve late successional habitat for species dependent on that habitat type, but in riparian areas this habitat is still susceptible to high severity fires and habitat loss due to competition between stressed trees.

Cumulative Effects

Cumulative effects will be the same as alternative 2, beneficial to fuels reduction and connectivity of LSR habitat protection and enhancement projects. Benefits may be slightly less without treatments in riparian reserves because fire would be able to move through the dense RRs and potentially carry into other parts of the landscape.

Alternative 5- No commercial thinning in units 3a, 19, 24b, and 33b (Northern spotted owl nesting habitat)

Under alternative 5 there are 60 acres of northern spotted owl nesting habitat that would not receive treatment and effects to late successional habitat would be similar to alternative 2. Crown fire activity and flame lengths vary by 1% under this alternative compared to the proposed action (Table 13 & 14). This

Table 13 - Comparison of flame lengths for alternatives 1, 2, and 5

	Fireline Intensity Hazard Rating	Percent of Area No Action	Percent of Area Alternative 2	Percent of Area Alternative 5	Percent Increase or Decrease (-)	
					Compare to No Action	Compare to Alt 2
less than 4	Low	22	92	91	69	-1
4-8	Moderate	1	1	1	0	0
8-11	High	1	0	0	1	0
11+	Very High	77	7	8	69	1

Table 14 - Comparison of CFA for alternatives 1, 2, and 5

Potential Crown Fire Class	Percent of Area No Action	Percent of Area Alternative 2	Percent of Area Alternative 5	Percent Increase or Decrease (-)	
				Compare to No Action	Compare to Alt 2
Surface Fire	18	92	89	71	-3
Crown Fire	49	4	6	-43	2
Torching	33	5	5	-28	0

This alternative would improve late successional habitat for those species that are dependent on that habitat type.

Cumulative Effects

Cumulative effects will be the same as alternative 2, beneficial to fuels reduction and connectivity of LSR habitat protection and enhancement projects.

Snag Dependent Species

Pileated Woodpecker (*Dryocopus pileatus*)

Pileated woodpeckers use dense mature forests with canopy closures of 40% or greater and an abundance of snags, downed wood, and stumps. Preferred snags are greater than 20 inches DBH, with at least three snags greater than 26 inches. Preferred nest trees are greater than 26 inches DBH, greater than 80 feet tall with a broken top or no top (USDA 1995). Pileated woodpeckers are cavity nesters and excavate large cavities located high in the snag. They generally only excavate the entrance of the cavity to access the hollow interior. Multiple entrances are excavated and are used as escape routes should a predator enter the cavity (Bull & Jackson 2011). Multiple snags are used as roost sites in either cavities made by decay or vacated nest sites (Schroeder 1982, Bull & Jackson 2011).

Pileated woodpecker's forage by excavation or by scaling the bark off of trees. Carpenter ants and other wood boring insects make up the majority of the pileated woodpecker's diet but they may also eat local fruits and nuts. Along with snags, large downed logs and stumps are important features for foraging (Bull et al. 2005). Forage habitat closely resembles reproductive habitat in terms of snag size and density and canopy cover (Schroeder 1982).

There are five documented sightings of pileated woodpeckers within the Pine Mountain project area and several surrounding the project boundary.

Acorn Woodpecker (*Melanerpes formicivorus*)

Acorn woodpeckers inhabit oak and pine-oak woodlands, as well as riparian corridors, Douglas-fir, redwood, and tropical hardwoods as long as oaks are present or available nearby. On the Mendocino National Forest they can be found using black oak, blue oak-grassland savanna, and conifer hardwood as and may be found in mixed hardwood and mixed conifer (MNF LRMP). Acorn woodpeckers can be found at sea level but are most abundant in the mountains (Koenig et al. 1995).

The Mendocino LRMP suggests at least 2 snags 15-24 inches DBH and 0.5 snag >24 inch be available per acre as optimum habitat. Sub-optimum habitat may supply 0.8-2 snags per acre at 15-24 inches DBH and 0.2-0.5 snags per acre >24 inches DBH. Acorn woodpeckers prefer snags greater than 40 feet tall, but will also use smaller snags if larger ones are not available (USDA 1995).

Although there are no documented sightings of acorn woodpeckers in the Pine Mountain project area but they are commonly sighted in the project area.

Western Gray Squirrel (*Sciurus griseus*)

On the Mendocino National Forest, suitable habitat for the western gray squirrel is black oak, black oak-grassland savanna, conifer/hardwood, mixed conifer, and mixed hardwoods. They may also be found in ponderosa pine habitats. Suitable habitat for the squirrel should contain at least three snags per acre that are 15-14 inches DBH and at least 0.5 snags per acre that are greater than 24 inches DBH (MNF LRMP).

There are no documented sightings of western gray squirrels within the Pine Mountain project area but there have been incidental sightings.

Douglas Tree Squirrel (*Tamiasciurus douglasii*)

Douglas tree squirrel inhabit conifer forests and may also inhabit mixed conifer and subalpine forests. In California they are year-long residents of conifer, hardwood conifer, and riparian areas. Preferred habitat is open and closed sapling-pole, large sawtimber, and old growth in stands 55-315 years old. Within their habitat squirrels use tree cavities, hollow trees and logs, and ground burrows as shelters. These squirrel can be found from sea level to 11,000 feet elevation. Douglas tree squirrel nests are generally loosely constructed stick nests in the summer and weather tight in dense foliage, hollow trees, or cavities in the winter. Nests are made of twigs, moss, lichen, and/or shredded bark. Douglas tree squirrel diet consists of mostly conifer seeds but also fungi, cambium, twigs, sap, leaves, buds, acorns and other nuts, mushrooms, fruits, and berries. They will occasionally eat arthropods, bird eggs, nestlings, and carrion. Foraging occurs in trees and on the ground and food may be cached for six to nine months. Home ranges for the squirrels are small (0.5 – 3 acres) and in good habitat may supports 2 squirrels per hectare (Pfau 2004, Timossi et al. 1995).

There are no documented sightings of Douglas tree squirrel within the project area but there have been incidental sightings.

Conclusions for All Snag Dependent Species

Alternative 1 - No Action

Under the No Action alternative the project area is at a high risk for moderate to high severity fires and density and fuel loadings would continue to increase. The current density is not allowing trees to grow and develop into larger trees that will eventually die and become larger snags to replace the currently available snags that will eventually fall and contribute to fuel loading. Within the Back Fire perimeter snags will continue to fall and contribute to fuel loading, too.

In conclusion, without treatment snags may remain in the short term but will eventually fall and contribute to fuel loading which could lead to a high severity wildfire.

Cumulative Effects

Past and current actions within the 7th field watershed of the Pine Mountain project have focused on fuels reduction and competing vegetation. These treatments may have removed snags and under the no action alternative all snags within the project area will remain on the short term. Due to the snag retention guidelines in the LRMP, the removal of snags in past and current projects is probably minimum and this alternative's snag contribution would be minimal.

Alternative 2 - Proposed Action

Under the Proposed Action all treatment prescriptions will receive prescribed fire in some capacity. Prescribed fire may be applied before or after hand or mechanical thinning treatments or by itself. Prescribed fire may remove some of the existing snags but may create new snags through overstory mortality. Overstory mortality is expected to be less than 10% in trees >16" DBH (Fuels report) and so snag creation may be minimal. Larger snags are generally not consumed by prescribed fire and the smaller snags that are created are too small for most wildlife to use. When planning a prescribed fire several factors are considered that would affect fire behavior so as not to remove all snags, as removal of larger snags can take years to recover: relative humidity, wind speed, temperature, fuel moisture levels, seasonal conditions, aspect, slope, and vegetation type.

Treatment Prescription 1

Treatment prescription 1 focuses on treating early successional plantations. This treatment reduces tree density, emphasizing the retention within the upper end of the diameter range (4-12") and increasing the distance between trees. Although this treatment does not directly affect snags it will stimulate trees in early and mid-successional stands and encourage a quicker advancement towards late successional characteristics which will lead to the creation of larger snags. This process will take time but will be beneficial to snag indicator species in the long-term.

This treatment will maintain all existing snags >20"DBH unless they pose a safety hazard or risk to prescribed fire control.

Treatment Prescription 2

Similar to treatment prescription 1, treatment prescription 2 treats naturally forested areas to reduce density and surface fuels. Thinning does not directly affect snags but reduction of competition for

resources will make stands more resilient to insects, disease, drought, and wildfire which may reduce the number of snags created by natural disturbances.

This treatment will maintain all existing snags >20" DBH unless they pose a safety hazard or risk to prescribed fire control.

Treatment Prescription 3

Treatment prescription 3 does not propose to remove larger snags through thinning. Snags that are removed will be done so for safety reasons. This treatment will maintain all existing snags >20" DBH unless they pose a safety hazard or risk to prescribed fire control.

Treatment Prescription 4

Treatment prescription 4 focuses on creating a location to successfully slow a wildfire in its progression eastward across the Pine Mountain project area.

Within treatment prescription 4 there will be one snag maintained for every quarter mile of fuel break.

Treatment Prescription 5

Treatment prescription 5 treats fuel continuity in chaparral fields. Although there are some forested stands intermixed within the chaparral fields, the primary treatment focus within these stands will be surface fuel reduction. It is unlikely this treatment will remove or create snags that would be used by snag dependent species.

Treatment Prescription 6

Treatment prescription 6 focuses on reducing surface and ladder fuels and maintaining a fire return interval within the Back Fire perimeter. The Back Fire burned in 2008 and has begun to lose snags that were created during the fire and will continue losing snags for the about the next 40 years (Fuels report). By returning the fire interval to this area and keeping surface fuel loads down, the loss of larger snags due to an intense or longer duration fire will be minimized. Prescribed fire does not generally consume larger snags and the snags created by prescribed fire are usually smaller and not used by wildlife. This treatment will help protect existing snags within the Back Fire perimeter by reducing fuel loads surrounding them.

Within the Back Fire perimeter a minimum of four snags >20" DBH will be retained, unless they are deemed a safety hazard. If there are less than four snags per acre >20" DBH then the four largest snags available will be retained.

Treatment Prescription 7

Treatment prescription 7 applies riparian reserve design features to the above treatments and will not have additional effects.

This treatment will still provide snags for snag dependent species due to design features and requirement by the LRMP.

Cumulative Effects

Past and current actions within the 7th field watersheds where the Pine Mountain project is located have been focused on fuel reduction and habitat enhancement. All projects are required by the LRMP to maintain a certain number of snags of a certain size per acre based on quality of habitat. Cumulatively this alternative will provide snags for snag dependent species.

Alternative 3- No New Temporary Roads

Alternative 3 would have the same effects on snags as alternative 2.

Cumulative Effects

This alternative will have the same cumulative effects as alternative 2.

Alternative 4 – No Commercial Thinning in Riparian Reserves

Alternative 4 would have the same effects on snags as alternative 2.

Cumulative Effects

This alternative will have the same cumulative effects as alternative 2.

Alternative 5 – No Commercial Thinning in Units 3a, 19, 24b, and 33b (Northern Spotted Owl Nesting Habitat)

Alternative 5 would have the same effects on snags as alternative 2.

Cumulative Effects

This alternative will have the same cumulative effects as alternative 2.

Coarse Woody Debris Dependent Species

Northern Spotted Owl (*Strix occidentalis*), Fisher (*Pekania pennant*), Northern Goshawk (*Accipiter gentilis*), Marten (*Martes caurina*)

Northern spotted owl, fisher, northern goshawk, and marten and effects to their habitat needs are discussed in the Biological Evaluation.

Pileated Woodpecker (*Dryocopus pileatus*)

See Snag Dependent Species for habitat discussion.

Conclusion for All Coarse Woody Debris Dependent Species

Alternative 1 – No Action

Under the no action alternative current coarse woody debris (CWD) on the ground would not be removed through treatment and would continue to build. Although it would be beneficial to CWD dependent species, this continued building of CWD adds to the current surface fuel which ranges from 4-75 tons per acre. Although not all of the project area contains excessive amounts of surface fuel some areas have accumulated levels that would be far more than what is seen in a fire resilient ecosystem. Surface fuel loading plays a major role in determining surface fire spread and flame lengths. Combined with ladder fuels and high canopy bulk density even the lower ranges of surface fuel loading puts the habitat at a higher risk during a wildfire (Fuels report).

Cumulative Effects

Past and current projects have focused on fuel reduction which may have removed coarse woody debris. There are requirements in the LRMP and design features in place to ensure the retention of a suitable amount of coarse woody debris. This alternative will maintain coarse woody debris within the project to make up for what was lost during other actions. Loss was likely minimal in past actions because of the design features and LRMP requirements and so this alternative's contribution of CWD is not necessary.

Alternative 2 – Proposed Action

Under the Proposed Action all treatment prescriptions will receive prescribed fire in some capacity. Prescribed fire may be applied before or after hand or mechanical thinning treatments or by itself. Prescribed fire may remove some of the existing coarse woody debris but may create CWD through mortality. Overstory mortality is expected to be less than 10% in trees >16" DBH but mortality in the smaller trees is more likely (Fuels report). When planning a prescribed fire several factors are considered that would affect fire behavior so as not to remove all larger CWD: relative humidity, wind speed, temperature, fuel moisture levels, seasonal conditions, aspect, slope, and vegetation type. The amount of CWD consumed depends on fire intensity and size, decay class, and moisture content of the woody debris.

Treatment Prescription 1

Treatment prescription 1 focuses on treating early successional plantations which generally have low amounts of coarse woody debris. Although thinning does not directly affect coarse woody debris it will stimulate trees in early and mid-successional stands and encourage a quicker advancement towards late successional characteristics which will lead to the creation of more CWD. This process will take time but will be beneficial to coarse woody debris indicator species in the long-term. During pile burning there is at least one pile left per acre with contributes to woody debris.

Hazardous snags and snags >20" DBH felled to facilitate burning will be retained as CWD. Existing large CWD (>20" diameter, or largest available) will be retained up to 5-10 tons per acre.

Treatment Prescription 2

Treatment prescription 2 treats smaller diameter trees within naturally forested areas and removes trees 10-20" DBH from around conifer and hardwoods. Thinning could increase smaller coarse woody debris through lop-and-scatter but the focus is to encourage stands to develop late successional characteristics by reducing competition for resources and removing ladder fuels. During pile burning there is at least one pile per acre left that will contribute to woody debris.

Hazardous snags and snags >20" DBH felled to facilitate burning will be retained as CWD. Existing large CWD (>20" diameter, or largest available) will be retained up to 5-10 tons per acre.

Treatment Prescription 3

Treatment prescription 3 has been designed to retain coarse woody debris as an important attribute of late successional habitat. There will be areas about ½ acre to 2 acres in size that contain concentrations of CWD that will not require surface fuel reduction but may still receive prescribed fire. Prescribed fire

may consume coarse woody debris but the amount consumed depends on fire intensity, size, moisture content, and decay class of the downed wood. Thinning may create small-diameter CWD through lop-and-scatter.

Hazardous snags and snags >20" DBH felled to facilitate burning will be retained as CWD. Existing large CWD (>20" diameter, or largest available) will be retained up to 5-10 tons per acre.

Treatment Prescription 4

Treatment prescription 4 creates a shaded fuel break which reduces surface, ladder fuels, and tree canopy bulk density for a break in fuel continuity to change fire behavior and create a strategic location for fire suppression and aid in prescribed fire application. Coarse woody debris within the shaded fuel break will not be maintained the same as the rest of the project area, only one log per acre of the largest available in decay class 1 or 2 will be retained. This will provide minimal shelter for CWD dependent species along roads.

Treatment Prescription 5

Treatment prescription 5 breaks up fuel continuity in chaparral fields and most of the chaparral within the project area is decadent. Although there are forested areas intermixed within the chaparral fields there may be minimal large woody debris available. These forested areas will receive a low intensity prescribed fire that may remove CWD.

Treatment Prescription 6

Treatment prescription 6 treats surface and ladder fuels within the Back Fire perimeter. Coarse woody debris varies within the fire perimeter and CWD continues to accumulate. Although this is beneficial to CWD dependent species it could increase fire intensity and duration. By continuing to burn the area with prescribed fire CWD may be reduced but the amount reduced depends on size, moisture content, and decay class of the downed wood. Larger debris is likely to be retained during a spring prescribed burn when moisture content is higher.

Hazardous snags and snags >20" DBH felled to facilitate burning will be retained as CWD. Retain existing large CWD (>20" diameter, or largest available) up to 5-10 tons per acre.

Treatment Prescription 7

Treatment prescription 7 applies riparian reserve design features to the above treatments and will not have additional effects.

This alternative will ensure retention of CWD for dependent species through design features and LRMP requirements.

Cumulative Effects

Past and current project have focused on fuels reduction which may have removed coarse woody debris but there design features and LRMP requirements that ensure the retention of CWD. This project would include those requirements as well and would not have adverse effects cumulatively with past and current projects.

Alternative 3 – No New temporary Roads

Alternative 3 would have the same effects on coarse woody debris as alternative 2.

Cumulative Effects

This alternative will have the same cumulative effects as alternative 2.

Alternative 4 – No Commercial Thinning in Riparian Reserves

Alternative 4 would have the same effects on coarse woody debris as alternative 2.

Cumulative Effects

This alternative will have the same cumulative effects as alternative 2.

Alternative 5 – No Commercial Thinning in Units 3a, 19, 24b, and 33b (Northern Spotted Owl Nesting Units)

Alternative 5 would have the same effects on coarse woody debris as alternative 2.

Cumulative Effects

This alternative will have the same cumulative effects as alternative 2.

Hardwood Dependent Species

Acorn Woodpecker (*Melanerpes formicivorus*)

See Snag Dependent Species

Western Gray Squirrel (*Sciurus griseus*)

See Snag Dependent Species

Black-tailed Deer (*Odocoileus hemionus*)

Black-tailed deer use a variety of habitat types in a variety of successional stages such as blue oak, blue oak-grassland savanna, conifer/hardwood, mixed hardwoods, mixed conifer, chaparral, chamise, shrub hardwoods, streamside shrubs, grass, herbaceous plants, and other miscellaneous shrubs for forage and cover habitat. Canopy cover should be around 40-50% for cover and 50-60% for forage areas (LRMP).

There is key winter range within the Round Mountain management area #8 as portions of Potato Hill and Middle Creek which are outside of the project area. Within Ericson Ridge Management Area #10 there are portions of Gravelly Valley as key winter range and Hull Mountain is key summer range, both of these areas are outside of the project area. The Pine Mountain Management Area #20 does not contain any key habitats for the deer.

Tule Elk (*Cervus elephus*)

Tule elk use a variety of habitat types and successional stages on the Mendocino National Forest. Forage vegetation may be black oak, blue oak-grassland savanna, chaparral, chamise, streamside shrubs, grass, and herbaceous plants. Cover vegetation may include forage species as well as conifer/hardwood, mixed hardwoods, mixed conifer, miscellaneous shrubs, and shrub hardwoods. Optimum cover/forage habitat ratio is 40-50% cover and 50-60% forage (LRMP).

Tule elk may be found in the Pine Mountain project area but they are more frequently seen along Soda Creek and Lake Pillsbury north of the project area. There is fall/winter habitat within the Ericson Ridge management area that falls within the project area. A bachelor herd of elk has been seen along Benmore Creek near Montgomery Glade.

Conclusions for All Hardwood Dependent Species

Alternative 1 - No Action

Under the no action alternative the density of the trees is not treated and the increased density contributes to the shading out of large hardwood trees and small hardwood patches. **Figure 2** demonstrates what is happening to a lot of the oak stands within the Pine Mountain project area. If the oaks continue to be suppressed long enough both the tops and root burls die. A healthy root burl is important for rapid sprout regeneration after a wildfire or other disturbance (Silviculture report). Under the no action alternative the loss of hardwood habitat is eminent, either to competition or wildfire.

Cumulative Effects

Past and current projects have focused on fuel reduction and habitat improvement surrounding the project area. These projects may have improved hardwood habitats but under this alternative hardwood habitats within the Pine Mountain project could be lost due to competition. Hardwoods are already being lost due to competition with conifers and this alternative will add to that loss.



Figure 2 - Photo taken on Aug. 23rd, 2016 of hardwoods that are being overtopped by conifers and reaching for the sunlight (within fuels unit 65, naturally forested areas – Treatment prescription 2)

Alternative 2 - Proposed Action

Under the Proposed Action all treatment prescriptions will receive prescribed fire in some capacity. Prescribed fire may be applied before or after hand or mechanical thinning treatments or by itself. Prescribed fire may remove some hardwoods. Overstory mortality is expected to be less than 10% in trees >16" DBH but mortality in the smaller trees is more likely (Fuels report). When planning a prescribed fire several factors are considered that would affect fire behavior: relative humidity, wind speed, temperature, fuel moisture levels, seasonal conditions, aspect, slope, and vegetation type.

Treatment Prescription 1

Treatment prescription 1 focuses on treating early successional plantations. There were no hardwood species planted but black oak and madrone have established themselves within the plantations naturally, about 16 acres of montane-hardwood conifer (Silviculture report). This hardwood component, even though it is natural regeneration, is affected by competition for resources within the stands. By reducing the density within plantations the effects will promote hardwood retention and growth.

Treatment Prescription 2

Treatment prescription 2 focuses on fuel reduction and habitat enhancement, similar to prescription 1, but in naturally forested areas. [Figure 2](#) shows a stand that would be receiving this treatment where the conifer overtopping the hardwoods is evident. [Table 6](#) shows the current vegetation within naturally forested areas. There is currently 452 acres of montane hardwood-conifer and 423 acres of montane hardwood within the treatment units. After treatment there will be no change to vegetation type or successional stage. This treatment focuses on lower story tree removal (4-10" DBH) with no effects to the upperstory large diameter conifer and hardwood trees. In some stands, conifer trees 10-20" DBH ([Figure 2](#)) crowding hardwoods will be removed. This treatment will promote oak retention and reduce competition to increase growth rates and advance large tree development.

Treatment Prescription 3

Treatment prescription 3 focuses on promoting or sustaining late successional habitat to improve growth, stand health, and reduce mortality. Hardwoods currently occur as individual trees or concentrated groups on one half acres to five acres. This treatment has a species specific treatment for hardwood groups where encroaching conifers will be removed from around hardwoods out to a distance of five feet from the drip line. All healthy dominant or codominant hardwoods, specifically black oak and Pacific madrone, will be retained throughout the treatment units.

[Table 15](#) shows species composition within treatment units pre and post-treatment. Thirty units show an increase in percent species composition of black oak, with only one decrease, and 10 units shows an increase in madrone.

Table 15 - Species composition pre and post-treatment for Treatment Prescription 3, black oak and madrone are highlighted

Unit	Acres	Existing Basal Area % Species Composition					Post Treatment Basal Area % Species Composition				
		DF	PP	SP	BO	MA	DF	PP	SP	BO	MA
3A	12	72	10	0	18	0	70	11	0	19	0
3B	24	67	9	0	25	0	62	10	0	28	0
4	86	65	13	1	21	0	56	14	2	28	0
5	29	91	0	0	9	0	86	0	0	14	0
6	113	58	25	2	15	0	51	25	2	23	0
7	77	46	7	27	15	6	29	0	36	25	11
8	131	66	12	3	11	8	70	0	5	14	11
9	16	100	0	0	0	0	100	0	0	0	0
12	32	57	9	18	16	0	36	0	35	30	0
13	59	55	11	8	26	0	45	14	10	32	0
14	91	68	10	3	19	0	56	11	3	29	0

Unit	Acres	Existing Basal Area % Species Composition					Post Treatment Basal Area % Species Composition				
		DF	PP	SP	BO	MA	DF	PP	SP	BO	MA
15	107	79	10	11	0	0	78	4	18	0	0
16	59	61	22	13	4	0	29	54	6	11	0
17	57	87	7	0	7	0	87	8	0	5	0
18	133	66	20	3	11	0	67	9	5	19	0
19	20	96	0	0	4	0	95	0	0	5	0
21	23	69	0	31	0	0	47	0	53	0	0
22	19	85	0	15	0	0	82	0	18	0	0
23	48	61	12	0	23	4	48	17	0	30	5
24A	14	43	14	30	13	0	27	21	29	23	0
24B	9	55	21	22	2	0	43	18	37	3	0
24C	25	70	10	11	9	0	65	9	10	16	0
24D	21	43	14	30	13	0	27	21	29	23	0
25	12	58	0	0	42	0	56	0	0	44	0
26	57	55	21	22	2	0	43	18	37	3	0
27	17	48	16	30	0	6	32	21	36	0	11
28	11	73	4	10	8	4	59	0	20	14	7
29	38	73	3	3	21	0	51	5	6	39	0
30	10	36	5	36	10	13	23	4	40	14	19
31	24	51	28	15	0	7	31	37	22	0	10
32	45	49	15	21	5	10	29	21	30	7	13
33A	10	64	0	12	23	0	61	0	14	25	0
33B	18	61	7	14	18	0	59	7	15	19	0
34	11	46	6	38	5	5	52	8	25	7	7
35	36	93	0	0	7	0	90	0	0	10	0
37	143	73	3	14	8	3	59	3	21	13	4
38	5	83	0	0	17	0	72	0	0	28	0
39	59	69	0	25	6	0	69	0	25	6	0

Treatment prescription 3 will be beneficial to hardwood MIS by increasing the percentage of species composition in hardwoods species and protecting and enhancing individual hardwoods and hardwood groups by removing the encroaching conifers.

Treatment Prescription 4

Within the proposed units for treatment prescription 4 there are 122 acres of montane hardwood-conifer and 24 acres of montane hardwood. The shaded fuel break overlaps with other treatments except on 145 acres. Where treatments overlap the appropriate prescription will apply (1, 2, 3, 5, or 6). For the units receiving only treatment prescription 4, there will be no change to vegetation type or seral stage post-treatment. This treatment focuses on removing small diameter trees to reduce ladder and surface fuels to create a break in fuel continuity. The treatment will maintain healthy large black oaks.

Treatment Prescription 5

Treatment prescription 5 treats chaparral fields to break up fuel continuity. There are forested areas intermixed within the chaparral units and about 270 acres of montane hardwood-conifer and 744 acres of montane hardwood. In these forested areas a low intensity prescribed fire will applied to reduce surface fuels and protect the trees in the overstory, including hardwoods. There is no treatment proposed for overstory vegetation.

Treatment Prescription 6

Treatment prescription 6 focuses on returning a fire interval back into the Back Fire perimeter. Under this treatment there are only 4 acres of montane hardwood-conifer and 15 acres of montane hardwood habitats. There is no anticipated change to vegetation acreage post-treatment.

Treatment Prescription 7

Treatment prescription 7 applies riparian reserve design features to the above treatments and will not have additional effects.

This alternative will improve hardwoods for hardwood dependent species.

Cumulative Effects

Past and current actions have focused on fuel reduction and competing vegetation. Cumulatively these projects will connect habitat improvement projects where oaks have been released from overtopping conifers and will benefit hardwood dependent species.

Alternative 3 – No New temporary Roads

Alternative 3 would have the same effects on hardwoods as alternative 2.

Cumulative Effects

This alternative will have the same cumulative effects as alternative 2.

Alternative 4 – No Commercial Thinning in Riparian Reserves

Alternative 4 would have the same effects on hardwoods as alternative 2.

Cumulative Effects

This alternative will have the same cumulative effects as alternative 2 but by limiting thinning to trees <10" DBH in riparian reserves conditions around hardwoods may remain too dense for release. This alternative may cumulatively add to the loss of hardwood habitat types.

Alternative 5 – No Commercial Thinning in Units 3a, 19, 24b, and 33b (Northern Spotted Owl Nesting Units)

Alternative 5 would have the same effects on hardwoods as alternative 2.

Cumulative Effects

This alternative will have the same cumulative effects as alternative 2.

Chaparral Dependent Species

California thrasher (*Taxostoma redivivum*)

The Mendocino LRMP HCM states that the California thrasher used mid to late successional conifer stands but literature reviews (CDFG 2005) have determined that thrashers do not require that habitat type.

California thrashers use chamise and shrub hardwood habitat type for optimum habitat and may also use blue-oak grassland savanna, miscellaneous shrubs, and streamside shrubs. Occupied chaparral habitat is generally moderate to dense in no less than 10 acre patch sizes. Riparian thickets may also be occupied especially those with California blackberry and California wild grape (CDFG 2005).

There are no documented sightings of California thrashers in the Pine Mountain project area but it is likely that they inhabit the brushfields within and near the Pine Mountain project area.

Black-tailed Deer (*Odocoileus hemionus*)

See Hardwood Dependent Species

Conclusions for Chaparral Dependent Species

Alternative 1 - No Action

There is an abundance of decadent chaparral with high concentrations of dead woody material that has the potential to produce higher intensity wildfires. Under the no action alternative the current condition of chaparral remains dense and decadent and prone to carry high intensity wildfire into the late successional habitat within the Pine Mountain LSR. Higher intensity chaparral fires have greater impacts on soil and hydrological stability. The chaparral within the Pine Mountain project is a variety of ages but it has not burned since 1932 and would readily burn in the case of wildfire.

This alternative will maintain chaparral habitats for chaparral dependent species but is prone to stand replacing wildfire.

Cumulative Effects

Past and current actions have focused on forested areas. There has been little work done in chaparral fields. There will be no direct effect cumulatively to chaparral fields. There may be loss due to wildfire should the chaparral go untreated.

Alternative 2 - Proposed Action

Under the Proposed Action all treatment prescriptions will receive prescribed fire in some capacity. Prescribed fire may be applied before or after hand or mechanical thinning treatments or by itself. Prescribed fire may remove some chaparral and hinder brush growth but it will also return biodiversity in brush seral stages and initiate seedling stage development. When planning a prescribed fire several factors are considered that would affect fire behavior: relative humidity, wind speed, temperature, fuel moisture levels, seasonal conditions, aspect, slope, and vegetation type.

Treatment Prescription 1

Treatment prescription 1 focuses on treating conifer plantations where shrub species such as chamise, manzanita, and various ceanothus species have established themselves. There is approximately 46 acres of these species within plantations and this acreage is spread across 6 different plantation units (Table 16). This treatment focuses on the tree's vigor and not necessarily the shrubs although by reducing density some of the shrubs may benefit.

Table 16 - Plantation units with shrubs established and their respective acreages (note that these are not all the plantation units, just the units with a chaparral component)

Unit	Vegetation							Total Acres
	Closed-Cone Pine-Cypress	Douglas Fir	Mixed Chaparral	Montane Hardwood-Chaparral	Montane Hardwood	Ponderosa Pine	Sierran Mixed Conifer	
40		18	3	15				36
45			2				15	17
53			14			14		28
60			5			5		10
61			4			5		9
62			3			4		7
Total Acre	0	18	31	15	0	28	15	107

Treatment Prescription 2

Similar to treatment prescription 1, treatment prescription focuses on tree growth and vigor and not necessarily the shrub component within stands. According to CWHR there is about 10 acres of chamise redshank chaparral, 210 acres of mixed chaparral, and 30 acres of montane chaparral within naturally forested areas that will receive this treatment. The treatment removes small trees and brush from the understory to raise canopy base height and reduce the risk of a fire crowning or torching.

Treatment Prescription 3

Treatment prescription 3 treats forested areas along ridgetops and upper slopes. There is one acre mixed chaparral identified in CWHR within treatment 3 units. This treatment will maintain that one acre of mixed chaparral post-treatment.

Treatment Prescription 4

Treatment prescription 4 creates a shaded fuel on 145 acres that do no overlap with treatment prescriptions. Where the treatments overlap the appropriate treatment will be applied (1, 2, 3, 5, or 6). There is about 35 acres of mixed chaparral within fuel break units. This treatment will remove ladder and surface fuels to create an area to aid in fire suppression or prescribed fire.

Treatment Prescription 5

Treatment prescription 5 utilizes prescribed fire as the primary tool for fuels reduction to break up the continuity of large chaparral fields without resulting in large-scale changes in the habitat type. Prescribed fire will also stimulate chaparral regeneration and contribute to the diversity of seral stages in the chaparral stands. This treatment may temporarily displace individual MIS species using this habitat but will improve the habitat in the long-term by providing a variety of seral stages and to ensure the retention of the habitat by protecting it from loss due to a stand replacing wildfire.

Chaparral patches make up about 32% of the treatment units in 3 to 40 acre patches and is mostly decadent. Since the chaparral has not been disturbed since 1932 it would readily carry a fire. Fire return intervals for chaparral tend to be between 30 and 90 years (Fuels report).

Table 17 - Vegetation types and seral stages within chaparral treatment units

Unit Number Seral Stage	CWHR Vegetation Type											
	Annual Grass Land	Blue Oak Foothill Pine	Blue Oake Woodland	Coastal Oak Woodland	Chamise-Redshank Chaparral	Douglas fir	Mixed Chaparral	Montane Hardwood Conifer	Montane Hardwood	Ponderosa Pine	Sierran Mixed Conifer	Total Acres
88	8			6	119	5	135	64	237	11	53	637
Early									3			
Mid				6				7	77	8	1	
Late						1		33	12		29	
Mature						4		24	145	3	23	
Decadent					119		135					
N/A	8											
89	5	1	6		102	28	250	205	507	8	73	1185
Early								1	4			

Unit Number Seral Stage	CWHR Vegetation Type											
	Annual Grass Land	Blue Oak Foothill pine	Blue Oak Woodland	Coastal Oak Woodland	Chamise-Redshank Chaparral	Douglas fir	Mixed Chaparral	Montane Hardwood Conifer	Montane Hardwood	Ponderosa Pine	Sierran Mixed Conifer	Total Acres
Mid		1	6			4		20	472	8	2	
Late						24		184	34		65	
Mature											6	
Decadent					102		250					
N/A	5											
Grand Total	13	1	6	6	221	33	385	269	744	19	126	1822

There will be a reduction of decadent chaparral post-treatment which will initiate regrowth and increase habitat heterogeneity. There is expected to be patched of 30-70% mortality, with the decadent chamise fields seeing higher instances of mortality. Fire will applied to develop a mosaic of burn severity patterns. Changes to chaparral canopy closure will be short term, generally lasting less than three years as young chaparral grows.

Treatment Prescription 6

There are no chaparral habitats identified under CWHR within the Back Fire perimeter.

Treatment Prescription 7

Treatment prescription 7 applies riparian reserve design features to the above treatments and will not have additional effects.

This alternative will remove some chaparral habitat but will not cause a downward trend of chaparral habitats on the Mendocino National Forest.

Cumulative Effects

Past and current projects have focused on projects within forested areas. Within these forested habitats there may have been patches of chaparral. Although there may have been decreases in chaparral, chaparral is stimulated by disturbances and will likely come back in the understory. This alternative will treat chaparral to provide for a variety of seral stages and will continue to provide habitat for chaparral species along with past and current projects.

Alternative 3 – No New temporary Roads

Alternative 3 would have the same effects on chaparral as alternative 2.

Cumulative Effects

Cumulative effects for this alternative will be the same as alternative 2.

Alternative 4 – No Commercial Thinning in Riparian Reserves

Alternative 4 would have the same effects on chaparral as alternative 2.

Cumulative Effects

Cumulative effects for this alternative will be the same as alternative 2.

Alternative 5 – No Commercial Thinning in Units 3a, 19, 24b, and 33b (Northern Spotted Owl Nesting Units)

Alternative 5 would have the same effects on chaparral as alternative 2.

Cumulative Effects

Cumulative effects for this alternative will be the same as alternative 2.

Riparian Dependent Species

Fisher (*Pekania pennant*), Northern Goshawk (*Accipiter gentilis*), Marten (*Martes caurina*), Bald Eagle (*Haliaeetus leuccephalus*)

Fisher, northern goshawk, marten, bald eagle and effects to their habitat are discussed in the Biological Evaluation.

Tule Elk (Cervus elephus)

See Hardwood Dependent Species

Peregrine Falcon (Flaco peregrinus)

Peregrine falcons requires cliff faces for nesting structures and there no suitable cliffs within the Pine Mountain project area. Peregrine falcons may forage in the project area and foraging habitat will be discussed in this document.

Peregrine falcons forage in wooded areas, marshes, open grasslands, coastal strands, and bodies of water. Foraging tends to occur close to the nest ([Pacific States Recovery Plan](#)).

There is one documented observation of peregrine falcon north of the project boundary along the Eel River.

Conclusions for Riparian Dependent Species

Alternative 1 - No Action

Under the no action alternative trends in fuel accumulation and vegetation structure would continue where many of the stands are already at a high risk for moderate to high severity fires. Without treatment, the riparian reserves are vulnerable to crowning and torching from wildfire and potential vegetation loss.

This alternative would maintain habitat for riparian species in the short term but would not protect the habitat from a wildfire or provide healthy, resilient trees to withstand other natural disturbances.

Cumulative Effects

Past and current actions have treated riparian reserves following requirements by BMPs and the LRMP. Cumulatively the no action alternative and past actions will provide habitat for riparian dependent species but untreated riparian zones may carry a more intense fire that could remove habitat inside the project area, but also in surrounding areas.

Alternative 2 – Proposed Action

Treatment Prescription 1

Treatment prescription 1 treats plantations and there are 59 acres of plantations that overlap with riparian reserves. This treatment reduces tree density, emphasizing the retention within the upper end of the diameter range (4-12") and increasing the distance between trees. Treatments within plantations that overlap riparian reserves will follow a special set of design features to ensure retention of riparian habitat. These design features include:

- Vegetation that is designated for treatment within the SMZ would either be removed in the thinning operation or hand piled for burning (BMPs 1.19, 1.22, 1.6, and 1.8). Not burning hand piles or no treatment within the SMZ is permissible if fuels objectives are still attained.
- Prescribed burning would be conducted within Riparian Reserves and SMZ areas, but active ignition are prohibited within the SMZs. Burning may "back down" into the RRs and SMZs; however, fire would be suppressed if intensity is such that riparian vegetation or overstory canopy mortality would occur.
 - **Exception-** No ignition will be allowed within 300 feet of the fish-bearing reaches of Benmore Creek and Bucknell Creek.
- On slopes <40%, no hand pile burning would occur within 25 feet of the channel high water line.
 - **Exception** – hand piles may be located within 10-25 feet of the channel high water line if there is a topographic break (flat or bench with slope <20%). During burning, fire would not be allowed to creep outside the perimeter of the piled material, and the downhill perimeter of burn piles would remain unlit in order to retain some slash for ground cover and to function as a sediment trap.
- On slopes 40-60%, no hand pile burning would occur within 25 feet of the high water line, and shall include the following requirements:
 - Piling should utilize topographic features (flats, benches, or areas of least slope (10-20%), where available, to stabilize piles.
 - Slash should be piled with stems oriented with the slope to prevent rollout.
 - **Exception** – hand piles may be located within 10-25 feet of the channel high water line if there is a topographic break (flat or bench with slope <20%). During burning, fire would not be allowed to creep outside the perimeter of the piled material, and the downhill perimeter of burn piles would remain unlit in order to retain some slash for ground cover and to function as a sediment trap.
- On slopes >60%, slash may be lopped and scattered, and within the lower 10 feet of the SMZ the slash is to be moved upslope >10 feet from the channel high water line

This treatment will protect and enhance habitat within riparian reserves to be more resilient to insect, disease, drought, and wildfire. There will be no change to vegetation type or successional stage. Treatment will stimulate trees to encourage advancement into later successional stages.

Treatment Prescription 2

Similar to Treatment Prescription 1, this treatment will protect and enhance habitat and promote successional stage development by reducing the density of trees <10" DBH and reducing surface fuels to improve resiliency of the stands to insects, disease, drought, and wildfire. By removing trees 10-20" around individual conifers and hardwoods the treatment will promote tree growth and advance large tree development. There will be no changes post-treatment to the vegetation type or successional stage.

This treatment will also follow the design features mentioned in prescription 1 for areas that overlap with riparian reserves. There are 2,234 acres within riparian reserves that will receive treatment prescription 2.

Treatment Prescription 3

Treatment prescription 3 promotes or sustains late successional habitat by working with the stands current heterogeneity. This treatment will improve growth, enhance stand health, and reduce potential mortality by reducing competition between trees for resources. Treatments will make stands more resilient to natural disturbances such as insects, disease, drought and wildfire.

The following are design features specific to treatment prescription 3 within riparian areas:

- Within the outer portion of the riparian reserves, which is from the SMZ out to a total of 150 feet, the thinning prescriptions would be the same as the stand-specific prescriptions. Trees within the riparian reserve will be directionally felled in a manner to prevent impacts to stream banks.
- Within the inner portion of the riparian reserves referred to as the SMZ portion located from the high water line to 50 feet out only trees less than 10 inches DBH would be thinned from below on 15-25 foot spacing, with leave tree spacing dependent upon tree size and crown diameter.
- Retain all riparian obligate (near water dependent) vegetation, including within the RRs of seeps, springs, and unstable areas
- Tractor piling is not permitted within the RRs on slopes >25%; however, mastication or grapple piling is permissible within the RR, but outside of the SMZs on slopes <35%.
- Hand removal (with chainsaws or hand tools) of vegetation within the SMZ is allowed, with location and burning of piles to follow the SMZ guidelines below. Retain 70-75% of existing ground cover (litter/duff) in the SMZ.
- Retain canopy cover consistent with the unit prescription, with a minimum of 50% in intermittent and ephemeral SMZs, and 70% in perennial SMZs.
- On slopes of <50%, retain 70-75% of existing ground cover (litter/duff) in the SMZ, and 60-65% of existing ground cover (litter/duff/rocks) in the remainder of the riparian reserve.
- On slopes >50%, retain 70-75% of existing ground cover (litter/duff/rocks) in the entire riparian reserve.
- Cover bare soil areas that exceed 50 square feet with mulch or slash, at the ground cover level appropriate for the slope class, if the area is likely to deliver sediment to a stream.

Treatment Prescription 4

There are XX acres of riparian reserves within the fuel break footprint. Where the fuel break overlaps with other treatments (1, 2, 3, 5, or 6), the area will receive that treatment. There are 145 acres of fuel break that does not overlap with another treatment prescription. In fuel break treatments the riparian reserves design features will be the same as those in treatments 1 and 2.

The shaded fuel break will maintain a canopy cover that provides a cooler environment for riparian species.

Treatment Prescription 5

Treatment prescription 5 breaks up the fuel continuity within chaparral fields. This reduction in fuel will benefit riparian species by protecting riparian habitat within the treatment units and surrounding habitat.

Treatment Prescription 6

Treatments within the Back Fire perimeter will reduce ladder and surface fuels and reduce density to create a landscape that will support a more historic fire regime. Treatments will protect and enhance riparian habitat by reducing the risk of a moderate to high severity fire. Drainages are typically major paths for fires so reducing the fuel in these areas will be very beneficial to riparian habitat within and immediately surrounding the Back Fire footprint.

This treatment will also follow riparian reserves design features mentioned in treatment prescription 1.

Treatment Prescription 7

Treatment prescription 7 Treatment prescription 7 applies riparian reserve design features discussed to the above treatments and will not have additional effects.

This alternative improves riparian habitat for riparian dependent species.

Cumulative Effects

Cumulatively, the past, current, and proposed action will provide for healthy and resilient riparian habitats for riparian dependent species.

Alternative 3 – No New temporary Roads

Alternative 3 would have the same effects on riparian as alternative 2.

Cumulative Effects

Cumulative effects for this alternative will be the same as alternative 2.

Alternative 4 – No Commercial Thinning in Riparian Reserves

Alternative 4 would have the same effects as alternative 2 except in riparian reserves where no thinning >10" DBH would be done. Stand conditions within riparian reserves are very similar to stands outside riparian reserves. Riparian reserves can be a major path for wildfire and fires may burn more intensely in riparian reserves (Fuels report). Under this alternative riparian reserves may experience more torching and crown fires and higher flame lengths (Tables 18 & 19).

Table 18 - CFA comparisons for alternative 1, 2, and 4

Potential Crown Fire Class	Percent of Area No Action	Percent of Area Alternative 2	Percent of Area Alternative 4	Percent Increase or Decrease (-)	
				Compare to No Action	Compare to Alt 2
Surface Fire	18	92	73	55	-19
Crown Fire	49	4	8	-41	4
Torching	33	5	19	-14	14

Table 19 - Flame length comparisons for alternatives 1, 2, and 4

	Fireline Intensity Hazard Rating	Percent of Area No Action	Percent of Area Alternative 2	Percent of Area Alternative 4	Percent Increase or Decrease (-)	
					Compare to No Action	Compare to Alt 2
less than 4	Low	22	92	79	57	-13
4-8	Moderate	1	1	3	2	2
8-11	High	1	0	1	0	1
11+	Very High	77	7	17	60	10

This alternative would maintain riparian habitat but it would still be at risk to more intense fires than under alternative two.

Cumulative Effects

Without being able to treat trees >10" DBH, this alternative may have more cumulative effects. Less intensely treated riparian areas may carry a more intense fire into habitats outside of the project area which could remove riparian habitat within and surrounding the project area.

Alternative 5 – No Commercial Thinning in Units 3a, 19, 24b, and 33b (Northern Spotted Owl Nesting Units)

Alternative 5 would have the same effects on riparian reserves as alternative 2.

Cumulative Effects

Cumulative effects for this alternative will be the same as alternative 2.

Conclusion for MIS Effects

Alternative 1 – No Action

Under the no action alternative habitats for all MIS would remain on the landscape. This alternative leaves the project area at a high risk to moderate and high severity fires which may remove late successional, riparian, chaparral, coarse woody debris, and hardwood habitat types. A high severity fire would create snags for the short term but the area surrounding the snags would lack a forest structure that is also used by snag dependent species (pileated woodpecker, northern spotted owl, northern goshawk, marten, fisher, etc.). After a high severity fire most coarse woody debris would be removed,

but would also be created after snags created by the fire fall. Again, this CWD habitat would lack a surrounding forested structure required by CWD dependent species.

In conclusion this alternative would maintain habitats for MIS species in the short-term but in the long-term could be deferential to all habitats and management indicator species.

Alternative 2 – Proposed Action

The proposed action would protect and enhance late successional, hardwood, chaparral, and riparian habitats. Snags >20" DBH will be retained in the project area unless they are a safety hazard or pose a risk to prescribed fire control. Snags that are felled will be retained on the ground as coarse woody debris. Coarse woody debris will be maintained at 5-10 tons per acre. Within the shaded fuel break, only one snag per quarter mile and one log per acre of the largest available will be retained.

In conclusion, the proposed action will provide for habitats for all MIS species for the long-term.

Alternative 3 – No New Temporary Roads

Alternative three would provide the same habitat improvements as alternative 2.

Alternative 4 – No Commercial Thinning in Riparian Reserves

Alternative 4 would have similar effects to all MIS habitats as alternative 2 except in riparian reserves where thinning would be less intense. Under this alternative riparian habitat would be maintained and available for use by riparian dependent species.

Alternative 5 – No Commercial Thinning in Unit 3a, 19, 24b, and 33b (Northern Spotted Owl Nesting Habitat)

Alternative 5 would have similar impacts as alternative 2 on MIS habitats.

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